

OBSERVATIONS

ON

Dr. BAKER's ESSAY

ON THE

ENDEMIAL COLIC

Of DEVONSHIRE.

By FRANCIS GEACH,Surgeon at PLYMOUTH, and F. R. S.

To which are added

Some REMARKS

On the same SUBJECT,

By the Reverend Mr. ALCOCK.

Audi alteram partem.

L O N D O N :

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1870

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devoid of all lead, taken in when new, and in larger quantities than can be subdued by the vital force of the stomach, will occasion the same severe symptoms? for such liquors, before they have acquired a proper fineness and strength by age, are apt to undergo a new fermentation in the bowels; whereby much hot elastic air is produced, causing all those spasms and colics, which commonly afflict immoderate drinkers of those liquors. That this air should be received into the cavities of the human body is not at all wonderful, seeing that air-bubbles are apt to get into all pipes and tubes that carry any fluid. And air indeed is an elementary or constituent part in all bodies whatsoever. Hence it is probable, that those severe pains felt in the extremities, are, for the most part, flatulent; since by rubbing the affected parts, the wind is often removed or expelled.

THOUGH this colic is seldom very ripe, unless in plentiful seasons of apples, when the common people drink immoderately of cyder, while yet foul and unracked from the gross lees, or in a state of absolute fermentation; yet, when we consider that
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it begins in autumn, a season at which the bile, by the heat, is exalted, and several new diseases commence; that what the sick vomit up is porraceous, and so corrosive, as to excoriate the mouth; that in consequence of this fluid, wind and spasms are engendered, which bring on an obstinate costiveness; that the urine and the serum of the blood will be green, and the very sweat sour; that eruptions will be thrown out upon the skin, which, now and then prove critical, but if, by imprudent management, they disappear too soon, the disorder will be translated again to the intestines; that upon catching cold, a stoppage of perspiration, or the least irregularity, all the colical complaints will return again, and sometimes with greater violence; that the jaundice will often put an end to it, and the rheumatism relieve it, but that it will begin afresh, if the pain of the limbs wears off too suddenly; that ladies who drink but little cyder, and children who drink none, are often troubled with colics: these circumstances considered, we have the strongest reason to believe, that this disorder cannot proceed from the lead used in the pounds, but must be ow-

ing, partly to the intemperate use of crude fruit and its juice not well fermented, and partly also to some peculiar disposition of the atmosphere, and consequently may be considered as an epidemical disease, which rages, as well as the small-pox and measles, with greater or less violence at one time than another. And when it does not shew itself in severe colics, the patient will be troubled with a diarrhæa or cholera; if with neither of these, the rheumatism: which disorders perhaps cannot be referred with propriety to a single cause, but have many concurring circumstances. And though it is generally more severe in autumn than any other season, (page 23) yet it continues often till the spring, when the constitution of the air changing, a new disorder succeeds it; which, however, for the most part bears evident marks of the same nature, being attended with the same symptoms, only in a milder degree. Further it may be observed, that warm autumns, which ripen the fruits and render their juices more elaborate, are less productive of this disorder than cold and inclement seasons: that in the first a diarrhæa or cholera will readily relieve the symptoms; while

while in the latter, (as the fruits never ripen kindly, but have, from first to last, an acerb and astringent juice, of which our cyder is often made) severe colics, obstinate constipations, and rheumatisms will prevail. And this difference of seasons may account why this disorder will rage with great violence in one autumn, and hardly be heard of in another, though in both there might be great plenty of fruit. Whereas, did it depend on the lead in the pounds, the same universal cause would always invariably produce the same universal effect; the contrary of which is proved by experience: for the colics, which happen in mild and warm autumns, are hardly to be distinguished from ordinary diarrhæas, which are the natural consequences of lessened perspiration, ripe fruit, and the sweet pomaceous juices.

PERHAPS it cannot be found that fruit, which brings on in children so many disorders, when eaten in an immature state, is ever very prejudicial after October; when, instead of abounding with a tartareous acid, the juices become rich and mucilaginous, and increase in their sulphureous and saccharine

charine qualities. Neither is it the colic only, that the juice of half-ripened fruits brings on : the gout and rheumatism are also very rife in those seasons, and probably from the same cause ; and therefore the nature of the disorder depends greatly on the disposition of the air and the quality of the fruit.

PAULUS ÆGINETA, as quoted by Dr. Huxham, observed that an epidemical colic, in his time, prevailed in Italy, and extended itself over a great part of the Roman empire ; which very disorder, as described by him, bears a near resemblance to the Devonshire colic, beginning and ending with the same symptoms, the loss of strength, the palsy and epilepsy.

As to the other cause of this disorder assigned by the doctors Huxham and Musgrave, to wit, the intemperate use of acids, it may be observed, that when they are mixed with the bile, they change both its colour and consistence, thickening it to a great degree ; and that the bile, being thus changed, loses its saponaceous quality, and becomes so corrosive as to fret even metals.

Patients

Patients troubled with the colic often vomit up such an acrid fluid. No wonder then, that from such powerful causes as corrupted bile, pent-up elastic air generated in the bowels, and an untoward disposition of the season, such a disorder should be produced, and all the dire attendants, with convulsions, often sue.

CITROIS calling this disorder *novus & popularis dolor colicus biliosus*, hints, that it was epidemical, and concludes that the bile is concerned in it; and with good reason, seeing that this fluid, when corrupted, brings on such severe complaints, especially in hot climates and hot seasons. In the West Indies this kind of colic was, some years ago, very common and very often fatal; and when it did not prove absolutely so, it left, however, the patients unstrung and enervated. But it appears now, from good authority, that this malady has, in a great measure, put off its severity; the inhabitants having found, from experience, that the too free use of acids was the chief cause of it, and therefore it is now customary to drink their rum and water but slightly acidulated. The same reason may be assigned

signed why the Turks receive no prejudice from their use of sherbet, which is also made but with a small proportion of acid; and such a liquor, so tempered and drank for pleasure, differs very much from an acid fermenting juice, drank in large quantities, and at a time perhaps when the body is overheated by labour.

THAT doctor Huxham is not singular in his opinion concerning acids giving the colic, particularly the West Indian colic, we may see in Dr. Arbuthnot's Essay on Aliment, 2d edition, p. 177. "The West
" India gripes, says he, perhaps, are oc-
" casioned by the too great quantities of
" acids, as lime juice, &c."

THOUGH there may be no analogy between the juice of apples and the poison of lead, yet it is to be presumed that the effects of an austere acid may produce the same symptoms as poisons, viz. enormous vomitings, violent pains, convulsions, &c. and may also impair the faculties. Doctor Wall is informed by a physician, that more lunatics are to be found in Herefordshire, than in the other adjacent cyder counties; which

which strengthens doctor Huxham's assertion, that immoderate quantities of this liquor affect the nerves, so as to cause the palsey, and in consequence of that a depravation of the faculties of the mind. So that even in this county, where no lead is said to be used in pressing apples, we see some of the same effects that are ascribed to the Devonshire cyder, and others which are worse ; since the loss of strength is not so deplorable as the loss of understanding.

THIS reasoning may be further confirmed, by observing, that children become convulsed from acids abounding in the stomach ; they often vomit up a sour liquor, and what they discharge downwards is curdled and green. There is reason to believe that the thrush arises from the same cause. The rickets are undoubtedly produced by a superabundant acid in the blood and juices : sour milk, vinegar, &c. being known to have a power of softening, and rendering limber, not only the cartilaginous tender bones of infants, but sometimes even the strong ones of adults. Hence the joints of rickety children become relaxed

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and grow out, their skin becomes yellow, and their flesh loose and flabby.

It may be observed, that the immoderate use of cyder stains the skin, and gives such pains in the limbs, that there is scarce a farmer in Devon of fifty years old, who is not, more or less, troubled with the rheumatism. That the acid is the cause of such complaints is evident; for the use of mild beer, which is an anti-acid, or cold water, gives ease, and sometimes will stop porraceous vomitings, when all other means prove ineffectual.

THAT jockeys are not liable to such a disorder from drinking vinegar, (which also cannot be always free perhaps from a mixture of lead, from the different vessels it may stand in) may be owing to their taking it only now and then, and in small quantities, and the violent exercise they immediately use, in all probability, prevents the evils to be expected from it. But it is not likely that jockeys use much vinegar; for the most robust, on using a considerable quantity of it, would soon find it attended

attended with very bad consequences. But to pass from jockeys, certain it is, that girls, in order to make themselves lean, have destroyed their health, lost the use of their limbs, and oftentimes their lives, by the frequent use of vinegar. Great heats, violent vomiting, severe colics, and a fallow countenance, being the usual consequences of such a step. And this may serve to answer that argument concerning chlorotic girls, who, though they may not be troubled with *severe* colics, are, nevertheless, seldom free from colical complaints; their hands too are often so enervated, as to be utterly unable to grasp any thing, to carry a glass to their mouths, or thread a needle. A young lady was lately under Dr. Huxham's care, for a disorder of this kind, and was cured by anti-acids and the cold bath.

THAT the poor inhabitants of Gloucester and Herefordshire, who drink weak cyder, are not altogether so subject to this colic, may be true; and yet I am well informed that it is not uncommon (even in those counties) to meet deplorable objects, with their hands dangling, and who, by

such imbecillity, are distinguished by the appellation of *the dangles*. The reason, therefore, why they are not afflicted with this colic, is not because no lead is used in the implements that make the cyder, but because the cyder itself may be less austere, and less loaded with that gross tartar, of which Dr. Huxham has taken notice.

ALTHOUGH no analogy is allowed to be between the juice of the apple and the poison of lead, yet Mons. Bouvart is introduced as saying, that mineral materials and austere wines (though different in their natures) bring on colics almost of the same species. Spigelius observed a colic to return periodically by drinking sour wine. Piso, Sennertus, Citerius, Crato, and Wepfer, made nearly the same observation. Now, though Devonshire cyder and the Rhenish and Moselle wines may not agree in every circumstance, they are, nevertheless, alike in one of no small consequence in the present case, I mean in that of their crude tartar. And that those wines do, in an unadulterated state, bring on the colic, we need only have recourse to Mons. Bouvart's own Words, as quoted by Dr. Baker, (page 15) in order to

prove it. Ces vins (ſcavoir de Rhen & de Moſelle) pechent ſouvent par trop de verdeur ; the wines of the Rhine and Moſelle often hurt by their too much acidity. Here we ſee that the miſchief proceeds, not from the adulteration, but the ſourneſs ; and this very circumſtance is remarked alſo by Piſo, de Morb. Profluv. Serof. p. 241, although greater miſchief may be done by their adulteration.

IT is ſaid (page 22) that the cauſe of this colic is not to be ſought for *in pure cyder, but in ſome fraudulent or accidental adulteration*. I believe it may be truly aſſerted, that no litharge (page 13) was ever uſed by any farmer in Devon ; neither is it probable that they would have recourſe to ſuch a project. They well know that treacle or burnt ſugar will give crude, watery, wheyiſh cyder a good colour, will ſoften and render it more ſaleable : and this is the uſual way of improving their cyder.

DOCTOR Baker obſerves, (page 58) *that cyder may in time deposit the greateſt part of its poiſon* ; but if cerus was thrown into cyder, the longer it remains there the more
impregnated

impregnated would the liquor be, and consequently old cyder would act like a poison as well as the new. But old cyder, well fermented, produces neither the colic nor the palsey, and therefore cautious farmers never suffer their families to drink cyder, till some months after it is made.

NEITHER is it probable that the ill effects of cyder can be imputed to the lead used in the machines that make it. Mr. Worth, a gentleman in the north of Devon, and a great cyder-maker, declares, that he never knew any lead at all used in any of the pounds, and yet his tenants and neighbours are more universally afflicted with the colic than any other people, in other parts of the county.

MR. Ward, a very reputable farmer near Oakhampton, informs me, that last autumn all the lead in his pound (which was a very small quantity) happened to get loose from the iron spill, and was, by the moorstone grinder, broken to pieces. This accident was not discovered, till a large quantity of cyder had run off. All this liquor, however, amounting to many hogsheads,
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and which (according to Dr. Baker's opinion) must have been fully impregnated with lead, has been since used without any ill effect. Two men drank twenty-two quarts of it in one day, without being in the least indisposed, which agrees with what Dr. Wall observes of the Herefordshire cyder, *that the common people will drink several gallons of it in a day, and yet be healthy and robust.* So that Devonshire cyder, when fermented, has not worse qualities than that made in Herefordshire.

BUT in fact, not one pound in fifty has any lead at all, or not of any consequence, in it. All the apples are compressed in wooden pounds, or ground in iron or wooden mills. Indeed a little lead is sometimes used in moor-stone troughs; and where the stones are not jointed closely, the interstices are filled, not always with lead, but often with clay, lime, sand, and stones. It cannot, I believe, be proved that sheet lead is nailed over any press, in any part of Devon (that at Alfington excepted) much less that the expressed juice is conveyed through leaden pipes. Indeed the apparatus is not so pompous. The
juice,

juice, when expressed, runs through bundles of reeds, or is strained through hair-cloths, and received into a stone trough, from thence it is immediately conveyed into a large *wooden* recevoir, and soon after put into pipes or hogsheads. The mills described by Dr. Wall are similar to those commonly used in Devon. The cramps, fastened with lead, are fixed in the bed of the mill, and seldom in the groove where the apples are ground. The grinding of them is always effected by means of oaken or moor-stone rollers, where mills are not used; but mills of late years are come much in use. Now allowing that the juice came in contact with all the lead that fastened the cramps (which can hardly be supposed) and did corrosive vinegar, instead of cyder; flow from the pounds, could it possibly extract the ill qualities of the lead *as it runs*? the time is too short to admit of it: some hogsheads of *must* will run off in the space of an hour. Besides, if cyder acted thus upon lead, the lead must soon waste away, and the implements would often stand in need of it. Small as this quantity of lead is (one grain to a gallon) with respect to its being the cause of such disorders,

disorders, it is much too great with respect to the quantity of lead first fixed in the pounds; the original quantity, in those few where lead is at all used, not exceeding four or five pounds. Now, according to Dr. Baker's proportion, a pound that makes one year with another two hundred hogsheads, must lose in solution, in one hundred years, one hundred and sixty pounds of lead: whereas the lead is not replaced once in a hundred years; during which time many thousand hogsheads of cyder will be made.

I would now humbly propose the following queries:

(1.) WHETHER out of the two hundred eighty five persons afflicted with the colic, and received into the Devonshire hospital, the greatest part of them might not have drank cyder made in mills, where no lead can possibly be found, at least none that came in contact with the juice? and whether therefore we must not necessarily believe, that the Devonshire colic proceeds more from the quantity of this beverage, or from some other cause, than the very

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small portion of lead, which may accidentally be taken up in pressing the apples? and whether one in a thousand has the common endemial colic?

(2.) WHETHER there is not a very material difference between the unfermented juice of limes or lemons, taken occasionally, and in small quantities, for the cure of the gripes, in a climate where the disorders arise, for the most part, from putrid and alkalious bile, p. 22. “Imo vero bilis putrescens ni ab acido mitigetur, virus in faniem acerrimam, omnia corrodentem mox abiit.” Huxham de morbo colico; and an acid juice guzzled down imprudently, in a fermenting state, and full of impurities?

(3.) WHETHER it is not known to most practitioners in Devon, that *white ale*, a liquor much used in some parts of that county, when drank to excess, has brought on the same colic, and the same kind of palsey? Mr. Rowe, a rope-maker, who never drank any cyder, but white ale in great quantity, has had this identical colic, and lost the use of his limbs by it; and out of many others who might be adduced,

is an instance in point. And no wonder, since this foul liquor, drank as it usually is, in a state of fermentation, is wont to turn sour in the stomach and intestines; and mixing with the bile, brings on all the symptoms produced by cyder. Nay this rule very likely holds good in all fermented liquors drank immoderately; the best wines, when taken too freely, will be vomited up as sour as vinegar.

(4.) WHETHER the experiments, which were made on the cyder that flowed from the leaden press at Alfington, were not rather unfair, and not at all sufficient to ascertain the facts mentioned and intended by them? Since I presume it does not necessarily follow, that because all the cyder, on which the experiments were made, turned black, that the blackness must *show evident signs of lead*, p. 34. For cyder will become black only by standing a short time exposed to the air, in a glass or silver vessel, especially when made of the fruit called the *bitter sweets*. How comes it to pass, that cyder (some thousand hogsheads of which are every year sent to London) does not produce the colic among the inha-

bitants there? The reason is plain, because when duly refined and well fermented, it is a very wholesome liquor, and an admirable antiscorbutic.

(5.) AFTER all, might not leaden shot, which are frequently put into bottles, in order to clean them, be left behind, which gave *solidity* to those experiments? and that this was actually the case, will appear now by the following extracts of letters from Mr. More, an eminent chymist, in Jermyn-street, to Dr. Baker himself; copies of which, Mr. More has also sent to Dr. Huxham.

TO DR. BAKER,

August 22, 1767.

S I R,

‘ A worthy friend having put into my
 ‘ hands your very ingenious pamphlet on
 ‘ the discovery of lead in the Devonshire
 ‘ cyder, I think it my duty both to your-
 ‘ self and the public, to lay before you
 ‘ some facts which have come to my
 ‘ knowledge relative to this affair; a mat-
 ‘ ter, in my opinion, of the highest con-
 ‘ cern, not only to the inhabitants of that
 ‘ county, but of the kingdom in general;

‘ as

‘ as very large quantities of Devonshire
 ‘ cyder, are annually sent to almost every
 ‘ part of his majesty’s dominions. I shall
 ‘ beg leave to quote the words of experi-
 ‘ ment 5, p. 45. “ In order to leave the
 “ matter entirely without doubt, an ex-
 “ tract from eighteen quart bottles of
 “ Devonshire cyder, (first strained through
 “ a cloth) which had been in my cellar
 “ more than three months, was prepared.
 “ This extract being assayed with the
 “ black flux, a quantity of lead weighing
 “ four grains and half, was found at the
 “ bottom of the crucible. These experi-
 “ ments were made in October 1766.”

‘ As by these it appears that the chief
 ‘ proof of Devonshire cyder, containing
 ‘ lead, depends on this experiment, I
 ‘ shall confine myself to the relation of
 ‘ such facts as refer immediately to it.

‘ ABOUT the month of October last (the
 ‘ precise time cannot now be recollected)
 ‘ Doctor Sanders, who had before been
 ‘ present at my making some assays of dif-
 ‘ ferent ores, mentioned to me, that he
 ‘ was endeavouring, at the request of a
 ‘ very

• very eminent physician, to discover whe-
 • ther any lead was contained in Devon-
 • shire cyder, and that an extract was pre-
 • paring from eighteen quarts for that
 • purpose. Not long after this, the doctor
 • brought me a quantity of dry matter, of
 • a dark brown colour, which he said was
 • this extract obtained from the foremen-
 • tioned cyder. Upon my hinting some
 • doubts as to the extract containing any
 • lead, he answered, he had already ob-
 • tained a considerable quantity from it;
 • and took out of his pocket another paper
 • containing several globules, one of which
 • I tried on an anvil, and found it perfect
 • malleable lead. These, he said, he had
 • picked out of the extract: and being
 • asked what degree of heat had been
 • given to the extract, or whether he
 • thought it had been made as hot as
 • melted lead; he said, he thought it had
 • not. And indeed, from its appearance,
 • it seemed never to have suffered such a
 • degree of heat, as that in which lead
 • melts; nor if it had, would any such
 • globules, as those shewn me by the doc-
 • tor, have been produced. From hence,
 • I concluded, the globules were no other
 • than shot; and desired him to say, whe-
 • ther

' ther the cyder had been kept in bottles or
 ' a cask. He told me it had been sent to
 ' him in bottles. I then mentioned to
 ' him, as my opinion, that the lead he
 ' had picked out of the extract, was only
 ' the remains of some shot, carelessly left
 ' in the bottles after washing; a thing not
 ' at all uncommon, though certainly, on all
 ' occasions, to be cautiously avoided.

' AFTER this, the doctor proceeded, by
 ' means of a saline flux, to try whether any
 ' lead remained in the extract. And when
 ' the assay was made, and the crucible
 ' broke, a very small globule of lead was
 ' found in it. The weight I know not;
 ' but think it could hardly be equal to four
 ' grains and half; and it seemed not at
 ' all improbable, that this might be the
 ' remains of another shot, which had es-
 ' caped the doctor's search, when he first
 ' examined the extract. Or if the cyder
 ' was impregnated with lead, from long
 ' standing on the shot in the bottles, (which
 ' I am strongly inclined to think was the
 ' case) such a particle of lead, as was found
 ' in the assay, may be very readily ac-
 ' counted for.

• OF the above-mentioned facts, I can, if
 • necessary, produce other testimonies than
 • my own.

• PERHAPS it may be urged, that the
 • experiment mentioned above, cannot be
 • that referred to in the pamphlet, p. 45,
 • as mention is there made of straining the
 • cyder through a cloth, which would in-
 • fallibly prevent any shot being found in
 • the extract. If so, it will afford high
 • satisfaction to every person concerned to
 • be informed, for what purpose the cyder
 • was strained through a cloth. For cer-
 • tainly any foulness in the cyder, separable
 • by straining, would have done no injury
 • to the experiment. And if cyder was
 • strained to separate any shot accidentally
 • left in the bottles, surely the cyder, (es-
 • pecially if we consider it had been kept
 • three months, and perhaps grown sour,)
 • was more likely to become impregnated
 • with lead, from those very shot, than
 • the must is in passing through a trough
 • at first pressing.

I am,

S I R,

Your most humble Servant,

S. M O R E.

To Doctor BAKER,

August 28, 1767.

S I R,

‘ WHEN Dr. Sanders called upon me
 ‘ on Sunday last, I shewed him the rough
 ‘ draught of the inclosed letter, which I
 ‘ had written the preceding day and which
 ‘ was intended to be sent to you, as soon
 ‘ as a fair copy of it was made. But as
 ‘ the doctor informed me he believed you
 ‘ would be glad of some conversation with
 ‘ me on the subject; and as I told him I
 ‘ was willing to wait on you whenever
 ‘ you did me the honour to let me know
 ‘ you was at leisure, I forbore sending the
 ‘ letter. Yet having now waited several
 ‘ days and heard nothing from you, I have
 ‘ taken the liberty of sending. For al-
 ‘ though Dr. Sanders said he was convinced
 ‘ the lead picked out of the extract, was
 ‘ no more than the remains of shot left in
 ‘ the bottles, and that you had given him
 ‘ eighteen other bottles of cyder to repeat
 ‘ the experiment, which he strained before
 ‘ the evaporation; yet, as he said also,
 ‘ that when that cyder was strained, some
 ‘ shot actually were found in the cloth; I

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‘ hope

‘ hope what I have written will not ap-
 ‘ pear superfluous, as it may serve to prove
 ‘ my conjecture, “ that the lead obtained
 “ by assaying the extract, proceeded from
 “ the cyder standing a considerable time
 “ upon the shot in the bottles,” was not al-
 ‘ together without foundation. My atten-
 ‘ tion to the quiet of several families in
 ‘ Devonshire, will induce me to send a
 ‘ copy of these papers to the very learned
 ‘ Dr. Huxham, with a desire that he may
 ‘ dispose of them as he shall think proper.’

I am,

S I R,

Your very humble Servant,

S. M O R E.

‘ P. S. In order to satisfy myself of the
 ‘ truth of my conjecture, (viz.) that the
 ‘ cyder became impregnated with lead by
 ‘ standing upon shot in the bottles; I
 ‘ made the following experiment.

‘ HAVING procured some Devonshire
 ‘ cyder, which I knew had been brought
 ‘ to London in a cask, and had never been
 ‘ bottled; I dropt into a wine glass full of
 it,

‘ it, four drops of a filtered decoction of
 ‘ orpiment in lime-water ; a small preci-
 ‘ pitation followed ; but the liquor was
 ‘ not in the least discoloured. But about
 ‘ a half pint of the same cyder being poured
 ‘ into a phial, (in which I had previously
 ‘ put two small pieces of lead,) when it
 ‘ had stood five days ; four drops of the
 ‘ orpiment liquor being dropt into a wine
 ‘ glass full of it, not only a precipitation
 ‘ followed, but the liquor became of a
 ‘ darkish brown colour ; a convincing proof
 ‘ that some of the lead was dissolved in it,
 ‘ and a strong argument for laying aside the
 ‘ use of lead shot in cleaning glass bottles.

C U R S O R Y



CURSORY REMARKS

BY THE

Reverend Mr. ALCOCK,

On reading Dr. BAKER's ESSAY on the
Cause of the ENDEMIAL COLIC of
Devonshire.



To the Reverend Mr. ALCOCK.

Reverend SIR,

I Received your cursory remarks on Dr. Baker's Essay on the Cause of the Endemial Colic in Devon. And as there appears something in them, well worthy of publick Notice, I should be glad to prefix them to some *Observations* of my own on the same subject; if I may be favored with your permission, for so doing.

I am,

Reverend Sir,

Your most humble Servant,

N. GEACH.

To Mr. G E A C H.

S I R,

YOU are at liberty to incorporate my observations with your own, or make any other use of them that you shall think proper. In some points, I find our thoughts nearly coincide. In others, we vary, but do not differ. And both may perhaps be of some service towards removing an unfavourable impression.

I am,

S I R,

Your humble Servant,

T. A L C O C K.

CURSORY REMARKS, &c.

Page 12. *I*T has not seemed to me at all probable, that two causes, i. e. the juice of apples, and poison of lead, bearing so little relation to one another, should make such similar impressions on the human body.

AN answer to this begins at the bottom of the next Page, from Mr. Bouvart. “ These three causes, to wit, corrupt bile, “ poisonous mineral substances, and raw “ austere wines, however different in appearance, may produce nearly the same “ sort of colics.” The *raw austere wines* here meant, were those of the Rhine and Moselle; and raw austere cyder must be allowed to be similar in its effects. See the note under page 15, where this same author says, “ *Ces vins pechent souvent par* “ *trop de verdeur.*”

Page 29. *Some melted lead being poured into the interstices.*

A workman at first sight would naturally fix his cramps inside the circular trough, in the groove or border, as here they do most service, and may be most conveniently inserted. What good genius or superior sagacity, then directed the people of the counties of Hereford, Gloucester, and Worcester, to shun this *occidental* blunder, and fix their cramps with the melted lead on the outside of the curb? See page 32. Were *they only* apprised of the pernicious effects of lead, and therefore thus were out of the ordinary way to avoid it? But I have frequently been in those counties, and have made enquiries about their cyder business; and by what I could find, their pounds are nearly the same as others.

Page 30. *It is common to line the cyder presses entirely with lead, or to make a border of lead quite round.*

VERY

VERY few vats or cyder-presses in Devon are lined with lead, or have a leaden border. I never saw or heard of any such, till this gentleman informed me of one at Alphington. Therefore the experiment made of the Alphington cyder, p. 34. allowing it to be conclusive at all, only concludes as to such sort of presses, and not as to the west country cyder-presses in general. It were to be wished, the *essayist* had made his trials from other and fairer specimens. A repetition of experiments, perhaps might discover some mistakes. Perhaps all the difference of colour might be owing to a greater degree of acidity in the Devonshire, than in the Herefordshire cyder. The apple-trees in Devon are injudiciously planted much nearer together, than they are in the counties of Hereford, Gloucester, and Worcester; much of the Devonshire fruit, must of consequence, not having equal advantage of sun and wind, be green and crude, and the juice austere and sharp; the Hereford people are also more careful in collecting and sorting their apples; do not pound them till they are thoroughly mellowed and sweated; and in doing this, they do not throw them into

large round heaps, as the custom is in the west, whereby the interior part of the heap becomes musty and putrid, and gives a disagreeable smack to, and weakens the cyder; but in broad flat heaps, of only about one foot in depth. I may mention too, that some of our Devonshire cyder, particularly what is made from a large proportion of sweet-apples, soon turns to a leaden or blueish colour on being exposed to the open air.

PAGE 33. *In many parts of Herefordshire, and the neighbouring counties, the stones of the mills are joined together with putty, which is whiting mixed with oil.*

I ALWAYS thought that *putty* had been made of white lead, oil, and whiting; the whiting however in greatest proportion: and on enquiry, the glaziers assure me, that this is the usual composition of putty. If then crude lead, which is so slowly soluble by acids, be so hurtful to the west country cyder, how comes it to pass, that white lead, which so readily imparts its noxious qualities, as being already in a state of solution, does not hurt the north-east

east country cyder? I should be glad of a solution of this.

PAGE 37. *Vegetable acid very readily receives an impregnation from lead, whether it be applied in its metallic or calcined state. Lead therefore united with wines or cyder, is in the condition of saccharum saturni.*

COMMON vegetable acids are impregnated by, or dissolve crude lead so slowly, and in such a very small proportion, in comparison of what they do minium, litharge, and cerusse, from which saccharum saturni is made; that cyder, allowing it to have sometimes a portiuncle of lead dissolved in it, could not with any propriety be said to be in the condition of saccharum saturni. The pounding troughs, I mean those few that have some lead in them, at first had not above two or three pounds; my own had not two pounds run into their interstices or cramp holes. These troughs, some of them at least, I am certain, have been in use these seventy or eighty years; and yet in all this time, scarce a single pound of lead has been consumed, the lead coming in contact with
the

the expreffed juice only in a few points: and that which is confumed, was rather worn off by friction, than minifhed by folution, and confequently has never incorporated with the cyder, but precipitated down with the fediment. What poffible effect then could fuch an inconfiderable portion of lead, with fuch a very fmall furface of contact, have had on all the cyder, perhaps ten thoufand hogfheads, that have been made there fince the firft erection of the machine? I may boldly anfwer, no fenfible effect at all. Be it, that half a grain of litharge, diffolved in one gallon of rhenifh wine, had a bad effect; very likely it had; fee p. 58. yet that would be of no moment in the prefent cafe; for here there could not have been half a grain in a ton.

Page 54. *Que leur plomb differe du notre.*

IF the Chinefe lead were of the fame nature with the European, one might be apprehenfive from the doctor's principle, that the vegetable acid of tea, fuch I mean as is brought hither in cadies, cannifters, or other leaden inclofures, might imbibe fome
noxious

noxious qualities from the metal. But I do not know that we have ever experienced any bad effects of this kind.

PAGE 56. *Some people, who have long accustomed themselves to cyder, have never experienced any of its bad effects. This difficulty can only be solved by recurring to that inexplicable idiosyncrosia, in which there is so remarkable a difference among men.*

IF it was true, that a portion of lead were dissolved in all, or most of our Devonshire cyder, and this produced the endemial colic ; it should follow, that such a constant general cause should produce a constant general effect ; and that, as great quantities of cyder are every year drank, the distemper should uniformly every year appear. But this is contrary to experience. The distemper is observed to rage most in great bearings and cold moist seasons. From the same dissolution of lead in our cyder, it should also follow, that the more a man drinks of this liquor, the more he should suffer by the disease ; and that no strength, or *peculiarity of constitution*, could be superior to the bad effects of the
4 poison.

poison. And yet great numbers, every year, drink immoderately of cyder, without perceiving any symptoms of the distemper; while many ladies, children, and valatudinarians, who drink little or no cyder at all, are frequently attacked with it. This shews, that the liquor is not the cause, at least, not the only cause of the disease. There is great reason to think, that several causes may concur. Lead, no doubt, where used, as at the pound described at Alphington, must be very hurtful. We want no new experiments to teach us this. Drinking immoderately of new cyder, foul, and not well fermented, is pernicious, as Dr. Huxham I think has shewn. The tartar, or essential salt of the liquor, in a moderate quantity, salutary, in excess becoming deleterious. Eating very much fruit, whether ripe or unripe, may contribute to the disease. And further, the nature of the atmosphere has a considerable effect. The autumnal season, in every part of England, is more or less productive of rheumatisms, diarrheas, cholics, palsies. The counties of Hereford, Gloucester and Worcester, are, as well as the west country, particularly subject to these

these disorders at this season, (Dr. Wall mentions rheumatisms, pag. 26.) and *danglers*, as they are called, that is, people with their hands pendulous or hanging down from the wrists, in consequence of colics and palsies, are frequently there to be met with. Perhaps the west country atmosphere may somewhat more peculiarly dispose the inhabitants to this distemper. Devonshire, especially the south-west part of it, is known to be subject to much rain. The immense quantity of vapour exhaled by the sun from the vast Atlantic ocean, and driven on land here by the south west winds, is checked in its farther progress by the interruption of our western alps, the high range of Dartmoor, and other hills, running nearly east and west into Cornwall, and being at these hills repelled and condensed, falls down in rain. This causes a more than ordinary moist atmosphere. And such a moist state of the air stops up the pores of the body, checks perspiration, and throws the matter, that ought to pass through the strainers of the skin, inwardly on the bowels; and, in conjunction with other causes, may produce an endemial colic. Several causes then

very probably conspire to produce this damnonian disease, and no one cause of itself may be adequate to the effect. But it is the common fault of writers to suit every thing to a preconceived hypothesis, and, rejecting or disregarding all other causes, to rest the matter absurdly upon one.

PAGE 60. *Secure the value of their property.*

I AM afraid the principal point advanced in this essay, will tend rather to injure, than secure our property ; will either frighten the cities of London and Westminster, and other distant towns and places, as well as many of our own people, from drinking any cyder at all ; or send them to Hereford, and its adjacent counties, for all the liquor of this kind, which they may chuse to purchase. For if the cry be once out, that the west country cyder is all poisonous, we must inevitably lose our markets for the present, and may never be able afterwards entirely to remove the prejudice, or falsify the evil report that has been brought upon our land. It seems as

necessary therefore, for the good of our west country plantations, to get this doctrine speedily refuted, as it was to get the cyder act repealed.

Not but we are greatly obliged to the learned author for his kind intentions, as he most certainly meant our good, and purposed to work a reformation, not the destruction of our cyder business. And we should take care to profit by his advice so far, as never to admit any lead to come in contact with the fruit or juice in the implements of cyder-making. But after this shall every where have been done throughout the province, I am of opinion the evil will not be removed, but that the damno-
nian colic will still make its appearance, and much in the same manner as heretofore prevail; if no other means be used to prevent or counteract it.

UPON the whole, I think the doctor has been too hasty in his conclusions; that the Alphington specimen was not a proper one; and that the cause here assigned is far from being adequate to the effect. In most places in Devonshire, the cause does not

exist at all. The apples are ground in mills, or pounded in troughs, where no lead is ever used in the apparatus. In some places the cause may seem partly to exist; a trifle of lead may be melted into the cramp holes. But the quantity is so small, few pounding troughs containing more than two or three cramps; and the surface of contact so inconsiderable, that the effect of the lead on such a quantity of liquor, as was above mentioned, would be as nothing; would be only as a drop in the ocean. In a very few places, Alphington it seems is one, the cause may in some degree exist; where sheet-lead is spread over the vat, or the cyder is conveyed through leaden pipes. The author says this is common, p. 30. If it be, he easily might, and should, have specified more instances. Hearsay, or a random assertion, is not to be allowed in a matter of so much importance. But suppose this to be fact in ten, twenty, or a hundred pounds, though I believe it is not so in half a dozen, such a partial local cause could not possibly operate on a whole province, or produce a general epidemic disease in places where there are no such pounds, as well as where there

there are. And therefore, notwithstanding the doctor may have laboured to overthrow the hypotheses of others, I am very sure his own cannot stand.

It must however be acknowledged, that the man of learning and genius, appears in the work, notwithstanding his being erroneous in the main point here combated.

August 27,
1767.

THO. ALCOCK.

E I N I S

E R R A T A.

- Page 20. Line xvii. *for* in the Devonshire *read* in Devonshire.
 21. Line xvi. *after* these, *add* Words.
 22. Line viii. *for* this *read* the.
 23. Line ii. from the bottom, *for* in *read* on.
 24. Line xvi. *for* if Cyder *read* if the Cyder.
 24. Line iv. from the bottom, *for* at first pressing *read* at the first pressing.
 25. Line xvi. *after* sending *add* it.
 25. Line last, *for* actually were found in the Cloth *read* were actually found on the Cloth.
 26. Line xix. *for* upon Shot *read* upon the Shot.

There are And the line between
the two may have been about the
middle of the 17th century I am
not sure of the exact date.

The line between the two
may have been about the
middle of the 17th century I am
not sure of the exact date.

THE ALICE
1712

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1712

There are two lines between
the two may have been about the
middle of the 17th century I am
not sure of the exact date.